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25 November 2004

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/050519

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A01H5/00 C12N15/82 A01H5/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/36084 A (AGRICOLA TECH INC) 20 August 1998 (1998-08-20)	1-7, 9-11, 14-22
Y	page 2, line 11 - line 23 page 9, line 7 - line 14 page 35, line 6 - page 37, line 12	8,23,24
X	LUCCA PAOLA ET AL: "Approaches to improving the bioavailability and level of iron in rice seeds" JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE, vol. 81, no. 9, July 2001 (2001-07), pages 828-834, XP001183265 ISSN: 0022-5142	1,4-7,9, 10,14-20
Y	page 832, right-hand column, last paragraph - page 833, left-hand column, paragraph 3	8,23,24
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

20 September 2004

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07/10/2004

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2004/050519

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 7 November 1991 (1991-11-07), TAKAHASHI: "A. thaliana AtMT-1 mRNA for metallothionein-like protein" XP002297021 Database accession no. X62818 the whole document	11-13 8,23,24
Y	-----	
X	ZHOU J ET AL: "STRUCTURE, ORGANIZATION AND EXPRESSION OF THE METALLOTHIONEIN GENE FAMILY IN ARABIDOPSIS" MOL. GEN. GENET, XX, XX, vol. 248, 1995, pages 318-328, XP000907576 the whole document	11-13 8,23,24
Y	-----	
A	PATER DE B S ET AL: "THE PROMOTER OF THE RICE GENE GOS2 IS ACTIVE IN VARIOUS DIFFERENT MONOCOT TISSUES AND BINDS RICE NUCLEAR FACTOR ASF-1" PLANT JOURNAL, BLACKWELL SCIENTIFIC PUBLICATIONS, OXFORD, GB, vol. 2, no. 6, 1992, pages 837-844, XP000907326 ISSN: 0960-7412 cited in the application abstract	
A	COBBETT CHRISTOPHER ET AL: "Phytochelatins and metallothioneins: roles in heavy metal detoxification and homeostasis." ANNUAL REVIEW OF PLANT BIOLOGY. 2002, vol. 53, 2002, pages 159-182, XP002297019 ISSN: 1543-5008 cited in the application the whole document	
A	SUH M C ET AL: "Cadmium resistance in transgenic tobacco plants expressing the Nicotiana glutinosa L. metallothionein-like gene." MOLECULES AND CELLS. 31 DEC 1998, vol. 8, no. 6, 31 December 1998 (1998-12-31), pages 678-684, XP009036622 ISSN: 1016-8478 the whole document	
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2004/050519

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KAERENLAMPI S ET AL: "Genetic engineering in the improvement of plants for phytoremediation of metal polluted soils" ENVIRONMENTAL POLLUTION, BARKING, GB, vol. 107, no. 2, 2000, pages 225-231, XP002287818 ISSN: 0269-7491 the whole document	
A	THOMAS JOHN C ET AL: "Yeast metallothionein in transgenic tobacco promotes copper uptake from contaminated soils." BIOTECHNOLOGY PROGRESS, vol. 19, no. 2, 21 November 2002 (2002-11-21), pages 273-280, XP002297020 ISSN: 8756-7938 page 276, right-hand column, paragraph 4	
A	EVANS KATHERINE M ET AL: "Expression of the metallothionein-like gene PsMT-ALPHA in Escherichia coli and Arabidopsis thaliana and analysis of trace metal ion accumulation: Implications for PsMT-ALPHA function" PLANT MOLECULAR BIOLOGY, vol. 20, no. 6, 1992, pages 1019-1028, XP009036607 ISSN: 0167-4412 the whole document	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/050519

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9836084	A	20-08-1998	AU	6152998 A	08-09-1998
			WO	9836084 A2	20-08-1998

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



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- (74) Common Representative: CROPDESIGN N.V.; Technologiepark 3, B-9052 Zwijnaarde (BE).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
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- (72) Inventor; and
- (75) Inventor/Applicant (for US only): SANZ MOLINERO, Ana, Isabel [ES/BE]; Bernheimlaan 38, B-9050 Genbrugge (BE).
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[Continued on next page]

(54) Title: PLANTS HAVING MODIFIED GROWTH CHARACTERISTICS AND METHOD FOR MAKING THE SAME

Type 1

Alu71a NAAGSAGGCG SCAGGAGGCG KHYV NKSC UNAGGAGGCG GAGGAGGCG
Alu71b NAAGSAGGCG SCAGGAGGCG KHYV NKSC UNAGGAGGCG GAGGAGGCG
Alu71c NAAGSAGGCG SCAGGAGGCG KHYV NKSC UNAGGAGGCG GAGGAGGCG
Alu71d NS...CGAG SCAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu71e ASG...CGAG SCAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu71f ASG...CGAG SCAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG

Type 2

Alu72a NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu72b NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu72c NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu72d NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu72e NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu72f NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG

Type 3

Alu73 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu74 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu75 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu76 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu77 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu78 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG

Type 4

Alu79 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu80 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu81 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu82 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu83 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG
Alu84 NSAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG GAGGAGGCG

(57) Abstract: The present invention concerns a method for modifying the growth characteristics of plants by modulating expression in a plant of a nucleic acid sequence encoding a metallothionein and/or modulating activity in a plant of a metallothionein. The invention also relates to transgenic plants having modified growth characteristics, which plants have modulated expression of a nucleic acid encoding a metallothionein.

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